

I CLAIM AS MY INVENTION:

1. A mechanical breathing aid comprising:

an inspiratory sensor for measuring a tidal volume and pressure of a breathing

gas delivered during an inspiration phase of a respiratory cycle, said

inspiratory sensor generating ~~inspiratory sensor generating~~ inspiratory

sensor output signals representing said tidal volume and pressure;

an expiratory pressure regulator for regulating a gas pressure within an

expiration gas flow path dependent on a regulatory signal;

an expiratory pressure sensor disposed to measure an actual gas pressure

within said expiration gas flow path, said expiratory pressure sensor

generating an expiratory pressure sensor output signal representing said

actual gas pressure; and

a control unit operatively connected to said expiratory pressure regulator and to

said expiratory pressure sensor, said control unit calculating a target

pressure dependent on a compliance value calculated by said control unit

from the inspiratory sensor output signals during said inspiration phase,

and generating said regulatory signal in said ~~breathing~~ ^{respiratory} cycle dependent

on a magnitude of a difference between said target pressure and said

actual pressure.

2. A mechanical breathing aid as claimed in claim 1 wherein said control unit calculates said target pressure as an exponential varying function of time with a time constant dependent on said compliance value.

3. A mechanical breathing aid as claimed in claim 2 wherein said control unit calculates said target pressure according to $A + Be^{-t/\tau}$, wherein A and B are constants, t is time, and τ is said time constant.

4. A mechanical breathing aid as claimed in claim 3 wherein said control unit selects constants A and B dependent on said compliance value.

5. A control unit which generates a regulatory signal dependent on a magnitude of a difference between a target pressure and a measured gas pressure to control an expiratory pressure regulator of a mechanical breathing aid during an expiration phase of a ~~breathing~~ ^{respiratory} cycle, said control unit calculating a target pressure as a function of time dependent on a compliance value calculated from pressure and volume measurements of a breathing gas provided by said mechanical breathing aid during an inspiration phase.

6. A ~~mechanical breathing aid~~ ^{control unit} as claimed in claim 5 wherein said control unit calculates said target pressure as an exponential varying function of time with a time constant dependent on said compliance value.

7. A ~~mechanical breathing aid~~ ^{control unit} as claimed in claim 6 wherein said control unit calculates said target pressure according to $A + Be^{-t/\tau}$, wherein A and B are constants, t is time, and τ is said time constant.

8. A ^{control unit} mechanical breathing aid as claimed in claim 7 wherein said control unit selects constants A and B dependent on said compliance value.

8 CPA
19/1/12

JS 22/2/12

9. A control unit as claimed in claim 5 which calculates said compliance value from said pressure and volume measurements of said breathing gas provided by said mechanical breathing aid during said ^{respiratory cycle} breathing cycle.

CPA

19/1/12

JS 22/2/12